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Research paper

Preventive home visits to promote the health-related quality of life of home-dwelling older people: Baseline findings and feasibility of a randomized, controlled trial☆

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ABSTRACT

Background and aims: Studies on multiprofessional preventive home visits to older people are needed. We describe here the baseline findings and feasibility of a randomized controlled study on preventive home visits delivered by a multiprofessional team.
Materials and methods: Participants (n = 422) were home-dwelling people who were 75+ years old. They were recruited from the Hyvinkää municipal area. They were randomized into intervention and control groups. Participants in the intervention group received three home visits, delivered by a nurse, physiotherapist and social worker. Health-related quality of life (HRQoL), measured by 15D, was used as our primary outcome measurement. Feedback on the intervention was gathered from the participants.
Results: The mean age of our participants was 81 years. They scored 0.82 in the 15D HRQoL score, and 65% were female. The findings of both groups were similar in most background variables. The only differences between the groups were that lower proportions of participants in the intervention group had diabetes or used a walker. The professionals delivering the intervention reported that all intervention procedures had been delivered according to plan. Participants who responded to the feedback survey mostly reported having gained new information and were fairly content with the intervention. However, most participants felt the home visits had not improved their health or functioning.
Conclusions: We have successfully randomized participants into two study groups in this trial examining the effectiveness of preventive home visits. The intervention seems feasible and has mostly been well received.

1. Introduction

The older population is growing in the coming decades as the demographic change in European countries indicates. Society is facing increasing demands to offer health and social services to older people with limited resources. Therefore, preventive and proactive interventions supporting older people's health, functioning and well-being are needed. Preventive home visits (PHVs) for older people have been suggested as a means to enhance these goals, but the data on their effectiveness and cost-effectiveness are controversial [1,2].

Although there is a high number of trials exploring efficacy of PHVs [1], they are not easily comparable because of varying interventions, differing populations [2] and insufficient reporting and poor compliance [1,3–5].

Earlier studies show no clear effects when PHVs are targeted only on older persons at risk [6], thus demonstrating the importance of studying interventions that are targeted to unselected older populations. Multidimensional interventions, which consist of comprehensive assessment and close cooperation of several professionals, have been suggested to be more effective than only one nurse performing PHVs [4–6]. However, multiprofessional

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home visit programmes were studied only in a few randomized controlled studies [7,8]. Thus, a comprehensive assessment and multiprofessional intervention applied to an unselected older population could be an important area that has not been studied enough.

This randomized controlled trial investigates the effects of a comprehensive PHV intervention on older people's health-related quality of life (HRQoL) and the use of health and social services. The intervention was delivered by a nurse, physiotherapist and social worker. The study participants were home-dwelling 75 ± year olds with no regular home help or care. In this paper, we describe the baseline findings and feasibility of the intervention.

2. Methods

2.1. Participants

A postal letter was sent in May 2013 to all 2,692 residents who were 75 years old or older and living in the Hyvinkää area. This sample was obtained from the population registry office. The participant inclusion criteria for the study were:

- seventy-five years old or older;
- home dwelling;
- not receiving home help/nursing services;
- finnish speaking;
- living permanently in Hyvinkää.

An information letter explaining the trial and inviting participants was sent to the sample population (n = 2,692). Of them, 1143 returned a letter and showed interest in the study (Fig. 1). A postal survey was mailed to them. Those who fulfilled the inclusion criteria and returned the survey (n = 968) were contacted by the study nurse. Finally, the first consecutive 422 persons giving their informed consent were recruited to the trial.

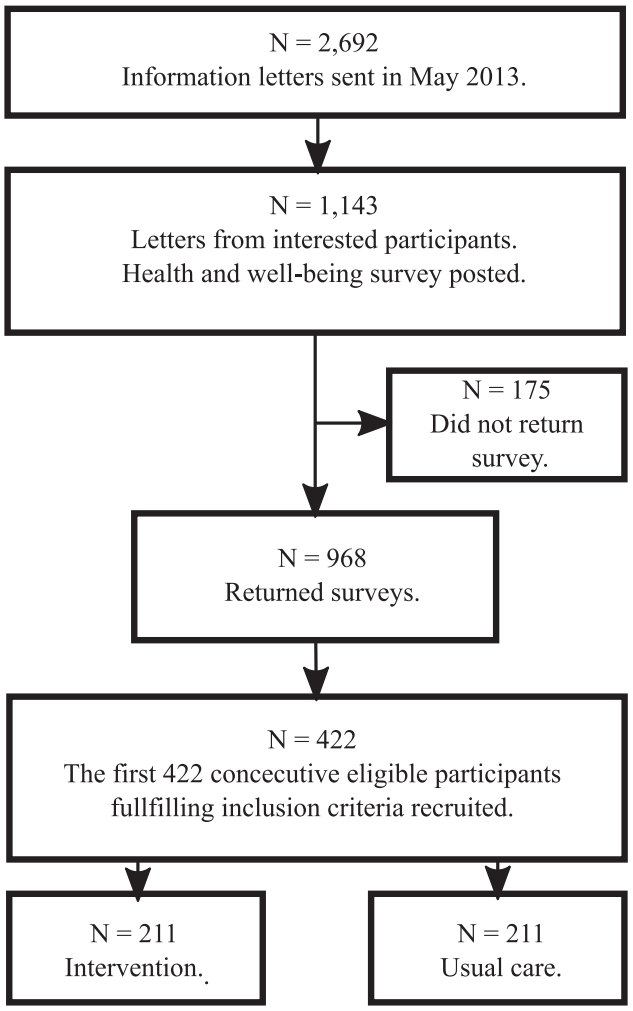

Fig. 1. Flowchart of study participant selection and randomization.

2.2. Measures and study procedures

The participants were assessed at baseline and at one- and two-year time points by the same postal survey. The survey, which explored comorbidities, physical functioning, risk factors and HRQoL, was posted to all participants in the intervention and control groups at these time points.

The survey included items about demography (age, gender, education, marital status), current height and weight, diagnoses (list of diseases with yes/no options), current medications, health habits and risk factors (smoking, use of alcohol, exercise habits, falls during the past six months) and use of assistive devices. Data on the use of prescription drugs and the use of health and social services were checked from the electronic health record.

We used the 15D instrument [9] as a primary outcome measure to investigate HRQoL. 15D is a generic 15-dimensional assessment scale. It can be used as a profile measure as well as a single index. The index varies between 0 (poorest HRQoL) and 1 (excellent HRQoL). The 15 dimensions of 15D are mobility, vision, hearing, breathing, sleeping, eating, speech, elimination, usual activities, mental function, discomfort and symptoms, depression, distress, vitality and sexual activity. 15D shows very good discriminant validity and prognostic validity in different aged populations [10], and it is sensitive to changes after performing a healthcare intervention [11].

Use of health and social services, institutionalizations and death dates of the participants will be retrieved from the central registers until two years after the first home visit.

A feedback survey on feasibility of the intervention was performed to the intervention group after the home visits. The items of the survey were chosen to be in line of the general aims of the intervention and to explore the satisfaction of participants.

2.3. Ethical aspects

The study was approved by the Ethics Committee of the Helsinki University Central Hospital. Oral and written information was provided to all participants. They had an opportunity to ask for more information about the study. All of the participants gave written informed consent.

2.4. Randomization

After baseline assessment, the participants were randomized into two groups with computer-generated random numbers. The control group received usual care, including normal healthcare offered in the municipality health centre, while the intervention group received intervention visits in addition to usual care. Spouses were always randomized together to the same groups to avoid dilution of the intervention effect.

2.5. Intervention

The PHVs were delivered by four nurses with experience working with geriatric patients, a physiotherapist and a social worker who were thoroughly trained. The team of professionals could consult a doctor from a geriatric ward if needed. The team

members planned and discussed the intervention protocol, and uniform instructions were given verbally and written on paper to everyone delivering the home visits. We standardised as far as possible how the nurse, physiotherapist and social worker acted depending on the results of their assessments.

The three home visits were delivered during a time period of six to nine months–the nurse visit was first, the physiotherapist visit was second and the social worker visit was last. The interval between each visit to the participant was circa three months, but due to practical arrangements, the interval varied.

The nurse home visit lasted 1–1.5 hours per participant. During the home visit, the nurse made a structured assessment using the interRAI Home Care Assessment System (RAI-HC) [12,13], Mini Mental State Examination (MMSE) [12,14], Mini Nutritional Assessment [12,15], Barthel scale [12,16], Geriatric depression scale (GDS-15) [12,17] and instrumental activities of daily living (IADL) [12,18]. The nurse measured the participant's blood pressure and blood glucose levels. The participant was given information about the different health and social services offered by the municipality and local volunteer and third-sector organizations. If concerns about the participant's health or well-being arose during the visit, the nurse directed them to contact their family doctor or other suitable health or social service and left written contact information for the respective services.

The physiotherapist home visit lasted 1–1.5 hours per participant. During the home visit, the physiotherapist made a structured assessment of the barriers of mobility, fall risk and home safety (FROP- Com Screen and home safety assessment) [19]. The physiotherapist also performed a hand grip strength test (Jamar) [20] and five-repetition chair stand test (CS-5) [21] on participants. Individual exercise instructions were compiled by the physiotherapist based on the test results and the motivation and wishes of the participant, and these compiled written instructions were given to the participant. Participants were given information on the services that the municipality physiotherapy offers for individuals and groups and services offered by local volunteer and third-sector organizations. Based on the assessment and the wishes and needs of participants, the physiotherapist left written contact information of the consequential services and/or arranged prospective physiotherapy services. The physiotherapist also assessed the need for aids and delivered the needed aids to the participants.

The social worker home visit lasted 0.5–1.5 hours per participant. During the home visit, the social worker made a structured assessment on social functioning, activities of daily living (ADL), IADL and service needs using structured forms. The social worker also gave information about financial and other benefits for older people and the social services provided by the municipality, The Finnish Social Insurance Institution (ISS), and local volunteer and third-sector organizations and left contact information when needed. If a need for services or financial benefits arose during the visit, the social worker helped the participant to contact the service provider in question or arranged an appointment.

Any questions from each professional that arose during the visit were discussed with the participant. The nurse gave an information card with instructions and actions to the participant at the end of the visit. During the visits from the physiotherapist and the social worker, the realization of actions agreed on the prior home visits and items marked on the information card were checked, and the physiotherapist or the social worker filled in the actions agreed during their visits.

2.6. Statistical analyses

Our primary outcome measure was 15D. We calculated the needed sample size with power calculation based on a change of 0.03 points in 15D, which has been considered clinically significant [9]. The standard deviation of 15D has been 0.15 in prior studies [22]. The calculated minimum sample size was 196 study participants per study arm, when type 1 error is 5% and power 80%.

We are analysing all results according to the intention-to-treat principle. All participants having baseline and at least one follow-up assessment will be included. In these baseline findings, we describe the groups as proportions for categorical variables and means with standard deviations for continuous variables. The χ^2 test and Fischer exact test were used to test differences between the intervention and control groups at baseline for categorical variables, and the t-test and Mann-Whitney U-test were used for continuous variables, as appropriate. Multiple imputations were performed for some missing 15D items with the method of chained equations and five sets of imputations, as implemented in the Stata ice add-on. $P < 0.05$ was taken to denote statistical significance.

3. Results

3.1. Baseline findings

The baseline characteristics of the intervention and control groups were similar (Table 1). The participants' mean age was 81 years, and the proportion of females was 65% in both groups. Compared to the background population of Hyvinkää of respective age, the mean age was slightly lower than the general population (81.6 years), the proportion of females was similar (65%), whereas the proportion of married older people was higher (51% vs. 41%).

There were no significant differences between the groups in Charlson comorbidity index or in most individual diagnoses. Lower proportions of participants in the intervention group suffered from diabetes than in the control group. Similarly, a lower proportion of participants in the intervention group used walkers as an assistive device compared to the control group. However, there were no other significant differences between the groups. The participants of the intervention and control groups also had similar baseline scores in 15D (Table 1).

3.2. Feasibility of intervention

The professionals delivering the intervention reported that home visits were carried out as planned. Some home visits were postponed to a later date due to reasons such as acute illness, but none were completely cancelled. The nurses, physiotherapists and social workers delivering the home visits reported that the structured assessments and planned interventions were concluded during the visits as planned. The participants were usually positive about the home visits, welcoming new information and actively taking part in discussions and tests during the visits. During their visits, the physiotherapist and social worker checked whether the participant understood the instructions left by the prior visitor. The participants had mostly followed the instructions. If needed, the visitor prompted the participant to continue accomplishing the instructions or helped contact the parties mentioned in the instructions.

3.3. Participants' satisfaction and feedback

Of the participants in the intervention group, 81% gave feedback on a survey. The participants reported to be mostly satisfied with the PHVs according to the feedback survey (Table 2). However, only 40% found direct benefits of the home visits, whereas 48% could not say whether they benefited or not. Only 13% thought the home visits were not beneficial. Of the responders, 70% reported having learned new information about available services, and 44% reported having received new information on supporting health.

Table 1
Baseline characteristics of the participants.

	Control ($n=211$)	Intervention ($n=211$)	P-value[d]
Females, n (%)	136 (65)	138 (65)	0.84
Age, mean (SD)	81.3 (4.3)	80.8 (4.3)	0.20
Marital status, n (%)			0.25
Married	105 (51)	110 (52)	
Widowed	84 (40)	72 (34)	
Single/divorced	19 (9)	28 (13)	
Education, years (SD)	9.8 (3.7)	10.0 (3.9)	0.63
Charlson comorbidity index[a] (SD)	1.4 (1.5)	1.3 (1.3)	0.61
Diagnoses or disorders, n (%) Cardiovascular			
Hypertension	116 (55)	129 (61)	0.20
Diabetes	46 (22)	28 (13)	0.02
Coronary artery disease	43 (20)	42 (20)	0.90
Cerebrovascular disorder	15 (7)	25 (12)	0.10
Musculoskeletal disorders			
Osteoarthritis	99 (47)	86 (41)	0.20
Osteoporosis	28 (13)	28 (13)	1.00
Traumatic fracture in prior 12 months	26 (12)	22 (19)	0.54
Respiratory disorders			
COPD/asthma	30 (14)	32 (15)	0.78
Neurologic/psychiatric			
Dementia	6 (3)	7 (3)	0.78
Depression	12 (6)	11 (5)	0.83
Other			
Cancer	36 (17)	24 (11)	0.09
Risk factors and health habits			
BMI (SD)	26.5 (4.9)	26.5 (5.0)	0.62
Smoking			0.60
Current, n (%)	6 (3)	10 (5)	
Ex-smoker, n (%)	36 (17)	35 (17)	
Alcohol risk use[b], n (%)	15 (7)	17 (8)	0.71
Mobility and falls			
Falls in prior 6 months, n (%)	54 (26)	68 (32)	0.14
Exercise (at least 30 min), n (%)			
1–7 times per week	145 (71)	149 (71)	0.88
Uses walker, n (%)	35 (17)	21 (10)	0.045
HRQoL: 15D[c] score (SD)	0.82 (0.11)	0.82 (0.11)	0.87

SD: standard deviation; BM: Body mass index; HRQoL: health related quality of life.
[a] Charlson et al., 1987.
[b] Alcohol risk use is over 7 doses/week for those over 65 years old.
[c] Sintonen 2001.
[d] Differences between the groups were tested by χ^2 or Fischer exact test for categorical variables and Mann-Whitney test for continuous variables.

Table 2
Answers to feedback survey on the home visits.

	Yes (%)	No (%)	Could not say (%)
Did you find the home visits beneficial?	66 (40)	21 (13)	79 (48)
Did you get new information about available services?	118 (70)	21 (12)	30 (18)
Did you receive new information on supporting or improving your health?	73 (44)	47 (28)	46 (28)
Has your health or functioning improved due to the home visits?	8 (5)	101 (59)	61 (36)
Has your wellbeing increased?	17 (10)	96 (58)	54 (32)
Do you wish to receive similar home visits in the future if there is an opportunity?	98 (59)	15 (9)	52 (32)

Most of the participants wished to receive further PHVs, with only 9% not wishing to receive visits in the future. However, most responded that their well-being (58%), health or functioning (59%) had not improved.

4. Discussion

We have successfully randomized 422 home-dwelling people (75+) to investigate the effects of a comprehensive, multi-professional PHV trial. The baseline data are complete, and the randomization groups are fairly well balanced at the baseline. Only prevalence of diabetes and use of walkers differed at the baseline. The intervention was largely delivered according to the original plan, and the professionals delivering the intervention were well involved. The participants found the visits to be helpful, though they did not report direct benefits on their health and functioning.

The participants are representative of home-dwelling older persons. They were slightly older and there were more married people in our sample but the background population includes also those frailest older people in institutional settings which explains the difference. Their mean age and distribution of genders are in line with previous studies on PHVs [7,8] and the general Finnish older population (75+ years old) [23,24]. Our participants' comorbidity index is slightly higher than in the general European population [25], and 15D HRQoL score is well in line with the general aged population [23].

Our study has several strengths. We use a rigorous randomized controlled design to ensure a random allocation of confounders in both groups. As the baseline findings in both groups are similar, we can state that the randomization was successful. However, there were few difference between the group indicating that we need to adjust the final analyses for the comorbidities and mobility devices. The study size is based on power calculation, and it should be large enough to show any significant clinical changes in 15D between the groups. Multidisciplinary, comprehensive interventions have been proven to be more effective than PHVs performed by a single professional [26]. If proven effective, this intervention could be feasible and transferable for primary care settings, as it consists of a relatively light programme with only three home visits, and it was well received by our participants. We are using a patient-centred outcome, HRQoL, to assess effects of PHVs. Patient-relevant outcomes have been considered of utmost importance when performing trials examining medical interventions [27].

There are also possible limitations to our study. The participants of our study were relatively healthy and had few limits to their functionality. This might cause a ceiling effect, which may prevent us from perceiving the positive changes caused by the intervention. The light intervention protocol is feasible, but at the same time, it might be less effective than some more intensive home-visiting programmes when working with older people [2]. This intervention indicated a total of 2.5–4.5 hours professionals' time per participant for during this 2-year follow-up. We will thoroughly count the cost-effectiveness when exploring our findings in the future. However, when researching intervention that could potentially be applied on the population level, the intervention has to be easily implemented.

According to our feedback survey, the participants of the intervention group were fairly content with the PHVs. Most of them reported having gained new information. However, most participants felt the home visits had not improved their health or functioning. This might be due to difficulties in perceiving changes in one's own health and well-being over time and due to health and functioning usually declining in the older population. The home visits aim to slow down this decline rather than increase health or functioning.

5. Conclusions

We have successfully randomized the participants at baseline. Professionals delivering the intervention have reported that the intervention was concluded as intended. Feedback from the participants has been mostly favourable.

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Disclosure of interest

The authors declare that they have no conflict of interest.

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